A YARDSTICK FOR GOOD NUTRITION

Recommended Dietary Allowances

PROTEIN
CALCIUM
IRON
VITAMIN A
VITAMIN B$_1$
(thiamin)
VITAMIN C
(ascorbic acid)
RIBOFLAVIN
NICOTINIC ACID
VITAMIN D

COMMITTEE ON FOOD AND NUTRITION
NATIONAL RESEARCH COUNCIL

MAY 1941

for additional copies write Nutrition Division, Federal Security Agency
Washington, D. C.

RECOMMENDED DAILY ALLOWANCES

Committee on Food and Nutrition, National Research Council

A guide to serve as a goal for good nutrition and as a "yardstick" by which to measure progress toward that goal has long been needed. In 1935 the League of Nations had made the only previous concerted effort to formulate such a "yardstick." The Committee on Food and Nutrition, of the National Research Council, was set up in 1940 to advise on nutrition problems in connection with National Defense. One of its first concerns was to work out recommended daily allowances for the various dietary essentials, for people of different ages.

The difficulty in such an undertaking lies in the lack of sufficient experimental evidence on which to estimate requirements for the various nutrients with any great degree of accuracy. Judgments as to requirements are necessarily based on incomplete and often conflicting reports of research and clinical findings and on data derived from work on animals. Experiments with the various vitamins also differ with regard to procedure and interpretation. These variables explain the wide divergence in "requirements" as set forth in current literature on nutrition.

The Committee's aim was to develop a table of allowances which would represent the best available evidence on the amounts of the various nutritive essentials desirable to include in practical diets. With this in view, literature on the subject was critically appraised, and in addition judgments as to the various requirements were solicited from a considerable number of nutrition authorities, representing various fields of research. On the basis of this evidence, a chart of recommended daily allowances for specific nutrients was worked out. The values as here given thus represent the combined judgment of nutrition authorities in various parts of the country. This does not mean, of course, that every contributor would fully agree with all the figures as given. It does mean, however, that the values are ones they were willing to accept tentatively, until standards derived from more exact data can be obtained. The term "Recommended Allowances" rather than "Standards" was adopted by the Committee to avoid any implication of finality.

In using these recommendations, it is important that the Committee's purpose and general policies in formulating them should be understood:

The allowances for specific nutrients are intended to serve as a guide for planning adequate nutrition for the civilian population of the United States. The vitamin figures are calculated requirements for food as eaten and do not allow for any extensive losses in cooking. The quantities as given were planned to provide a reasonable margin of safety, but it is recognized that they may not always be attainable under all circumstances. These allowances are to be distinguished from the minimum requirements recently proposed by the Food and Drug Administration for use in connection with the labeling of foods. The Committee realizes that the values proposed will need to be revised from time to time as more knowledge of nutritive requirements becomes available.

In addition to the three factors of the B complex included, other members of the group, such as vitamin B_6, and pantothenic acid, should be given consideration. But at the present time no specific values can be given for the amount required in the human dietary. It should be added, however, that foods supplying an adequate amount of thiamin, riboflavin, and nicotinic acid will tend to supply an adequate amount of the remaining B vitamins. Similarly diets providing adequate amounts of protein, calcium, and iron will tend to supply other needed minerals, though these are not listed. There is urgent need for continued research on the requirements for all dietary essentials, especially for children.

The allowances for adults are given for the 70 Kg. man and the 56 Kg. woman at three levels of activity. They will need to be proportionately increased or decreased for larger or smaller individuals. It will be noted that the allowances for thiamin, riboflavin, and nicotinic acid are proportional to the caloric intake. This relationship has been established for thiamin, and it has been assumed to hold also for riboflavin and nicotinic acid since, like thiamin, they are part of the enzymic system involved in the metabolism of carbohydrate.

The allowances for children are given by age groups, and for boys and girls separately after 12 years, since from that age the growth curves and levels of activity for the two sexes differ. The values given are in each case for the middle year in the group, and represent amounts needed for children of average size and activity. The needs for individual children may be proportionately larger or smaller depending upon size and activity.

It is to be understood that these allowances are for persons in health, and that needs may vary markedly in disease. For example, in febrile conditions there is usually an increased need for calories, thiamin and ascorbic acid. The need for these or other constituents may also be greatly altered in other diseases, especially those of the alimentary tract, which interfere with normal absorption.

It should be remembered that the amounts of the various nutrients provided for in these recommended allowances, with the exception of vitamin D, can be obtained through a good diet of natural foods, including foods like "enriched" flour and bread which have been improved according to recommendations of the Committee. It is the expectation of the Committee that nutrition workers in various parts of the country will translate these allowances into appropriate quantities of foodstuffs available in their localities. Such allowances, expressed in terms of everyday foods, can then be widely used in practical nutrition work.

RECOMMENDED DAILY ALLOWANCES FOR SPECIFIC NUTRIENTS*

Committee on Foods and Nutrition, National Research Council

	Calories	Protein grams	Calcium grams	Iron mg.	Vitamin A*** I.U.	Thiamin (B_1) mg.**	Riboflavin mg.	Nicotinic acid mg.	Ascorbic acid mg.**	Vitamin D I.U.
Man (70 Kg.)										
Moderately active.....	3000	70	0.8	12	5000	1.8	2.7	18	75	###
Very active.....	4500					2.3	3.3	23		
Sedentary.....	2500					1.5	2.2	15		
Woman (56 Kg.)										
Moderately active.....	2500	60	0.8	12	5000	1.5	2.2	15	70	###
Very active.....	3000					1.8	2.7	18		
Sedentary.....	2100					1.2	1.8	12		
Pregnancy (latter half).....	2500	85	1.5	15	6000	1.8	2.5	18	100	400–800
Lactation.....	3000	100	2.0	15	8000	2.3	3.0	23	150	400–800
Children up to 12 years:										
Under 1 year #.....	100/Kg.	3–4/Kg.	1.0	6	1500	0.4	0.6	4	30	400–800
1–3 years ##.....	1200	40	1.0	7	2000	0.6	0.9	6	35	###
4–6 years.....	1600	50	1.0	8	2500	0.8	1.2	8	50	
7–9 years.....	2000	60	1.0	10	3500	1.0	1.5	10	60	
10–12 years.....	2500	70	1.0	12	4500	1.2	1.8	12	75	
Children over 12 years:										
Girls, 13–15 years.....	2800	80	1.3	15	5000	1.4	2.0	14	80	###
16–20 years.....	2400	75	1.0	15	5000	1.2	1.8	12	80	
Boys, 13–15 years.....	3200	85	1.4	15	5000	1.6	2.4	16	90	###
16–20 years.....	3800	100	1.4	15	6000	2.0	3.0	20	100	

*Tentative goal toward which to aim in planning practical dietaries; can be met by a good diet of natural foods. Such a diet will also provide other minerals and vitamins, the requirements for which are less well known.

**1 mg. thiamin equals 333 I.U.; 1 mg. ascorbic acid equals 20 I.U.

***Requirements may be less if provided as vitamin A; greater if provided chiefly as the pro-vitamin carotene.

#Needs of infants increase from month to month. The amounts given are for approximately 6-8 months. The amounts of protein and calcium needed are less if derived from breast milk.

##Allowances are based on needs for the middle year in each group, (as 2, 5, 8, etc.) and for moderate activity.

###Vitamin D is undoubtedly necessary for older children and adults. When not available from sunshine, it should be provided probably up to the minimum amounts recommended for infants.

DIETARY "PATTERN" TO MEET THE RECOMMENDED ALLOWANCES

Milk, adults 1 pt., children 1-1/2 pts. to 1 qt.
Egg, 3 or 4 times per week.
Meat, 1 serving (1 oz. at 1 yr. up to 3 ozs. for adults).
Vegetables, 2 servings. One green or yellow.
Fruit, 2 servings. One citrus or tomato and one other, as apple, prunes, etc.
Potato, one or more servings.
Butter or fortified oleo, (100 - 500 calories).
Whole grain or "enriched" cereal and bread, at least half of the intake.
Sugar, fat, etc., to complete calories.

SAMPLE LOW-COST DIETARY

(As per Chicago Standard Budget Costing 32¢ per day)

Breakfast	Lunch	Dinner
Tomato juice	Baked navy beans	Pot roast and gravy
Oatmeal with top milk	Cabbage salad	Baked potatoes & oleo
Toast with oleo (+A)	Bread with oleo (+A)	Carrots
Coffee for adults	Prunes	Bread with oleo (+A)
Milk for children	Milk	Gingerbread
		Tea or coffee for adults
		Milk for children

Approximate food value of low-cost diet on preceding page:

Foods	Amount grams	Approximate measure	Calories	Protein grams	Calcium grams	Iron mg.	Vitamin A I.U.	Thiamin (B_1) gamma*	Riboflavin gamma*	Ascorbic acid mg.
Milk	480	1 pint	336	15.8	.58	0.15	528	244	1000	6
Meat	100	1/4 lb.	150	21.0	.01	3.00	50	120	225	—
Potatoes	350	3 medium	300	7.2	.05	3.66	144	432	162	12
Baked beans	200	1 cup	200	13.2	.09	4.00	110	235	130	—
Cabbage, raw	100	1 cup	25	1.1	.04	0.43	88	70	72	35
Carrots	100	1/2 cup	40	1.2	.04	0.64	2100	60	58	—
Tomato	200	5/8 cup	50	2.4	.02	0.80	2000	182	122	48
Prunes, stewed	200	5/8 cup	250	1.4	.03	1.88	990	120	132	—
Oleomargarine	66	5 Tbsp.	500				2600			
Oatmeal, cooked	300	1-1/4 cup	200	8.0	.03	2.40	—	270	60	—
Bread, wholewheat or "enriched"	200	6 slices	500	19.0	.10	3.0	—	480	207	—
Ginger bread	75	large piece	200	3.5	.08	2.0	—	40	30	—
Sugar, jam			250							
TOTALS			3001	93.8	1.07	22.0	8602	2253*	2234*	101
compared with								2.25 mg.	2.23 mg.	
RECOMMENDED ALLOWANCE			3000	70.0	0.80	12.0	5000	1.80 mg.	2.70 mg.	75

*1 milligram (mg.) equals 1000 micrograms (gamma)